RECEIVED
CENTRAL FAX CENTER
JUN 28 2007

REMARKS

This Amendment is responsive to the Office Action dated March 28, 2007. Applicant has amended claims 1, 4, 12, 20, 21, 28, 34 and 35, and canceled claims 11 and 27. Claim 4 has been amended to correct a minor typographical error. Claims 1-4, 9-10, 12-26, and 28-45 are pending.

Claim Rejection Under 35 U.S.C. §§ 102(b) and 103(a)

In the Office Action, claims 1-4 and 10-42 were rejected under 35 U.S.C. § 102(b) as being anticipated by Soykan et al. (U.S. Patent No. 6,151,525) or, in the alternative, under 35 U.S.C. § 103(a) as being unpatentable over Soykan et al. in view of Heil, Jr. et al. (U.S. Patent No. 4,819,662). Claims 3, 12, 13, 15, 28, 29, 31, 36, and 38-42 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Soykan et al. or, in the alternative, Soykan et al. in view of Heil, Jr. et al. Claims 9, 24, and 25 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Soykan et al. in view of Heil, Jr. et al.

Applicant respectfully traverses the rejection of the claims to the extent such rejections may be considered applicable to the claims as amended. Soykan et al., alone or in combination with Heil, Jr. et al., fails to teach or suggest each and every feature of the claimed invention, as required by 35 U.S.C. §§ 102(b) and 103(a), and provides no teaching that would have suggested the desirability of modification to include such features.

Independent Claims 1, 21, and 35

For example, neither Soykan et al. nor Heil Jr. et al. teach or suggest a method that comprises delivering electrical stimulation to tissue of a patient at a stimulation site via an electrode mounted on a lead and located proximate to the stimulation site, and eluting genetic material from a polymeric matrix to the stimulation site to cause transgene expression of a protein by the tissue at the stimulation site that increases the conductivity of the tissue at the stimulation site, where the lead includes a chamber body that defines a chamber and the chamber contains the matrix, as recited by Applicant's independent claim 1.

With the present Amendment, Applicant has incorporated the limitations of dependent claim 11 into claim 1, and canceled claim 11. Dependent claim 11 previously specified that

genetic material of claim 1 causes expression of a protein by the tissue at the stimulation site that increases the conductivity of the tissue at the stimulation site. With respect to the rejection of dependent claim 11, the Office Action stated that in the Soykan et al. reference, "the genetic material causes expression of contractile cells, which increases the conductivity of the cells."[1] Applicant respectfully disagrees. Soykan et al. does not discuss conductivity of contractile cells, or even suggest that expression of contractile cells by tissue increases the conductivity of the tissue or that there is any relationship between conductivity of tissue and the contractiveness of the tissue. The Office Action offers no support for the assertion that contractile cells increase the conductivity of the cells.

Soykan et al. does not teach, explicitly or implicitly, that the elution of genetic material causes the expression of a protein that increases the conductivity of the tissue at a stimulation site. Soykan et al. teaches an implantable system that includes a cell repopulation source that includes genetic material to convert fibroblasts into myoblasts.[2] Soykan et al. is concerned with reversing damage to necrotic heart muscle following myocardial infarction by repopulating the damaged myocardium with undifferentiated contractile cells.[3] Nothing in the Soykan et al. reference suggests increasing the conductivity of the tissue at a stimulation site.

Soykan et al. provides no motivation for increasing the conductivity of tissue at a stimulation site. In other words, a person of ordinary skill would not see any reason to increase conductivity at a stimulation site based on the teachings of Soykan et al. While Soykan et al. teaches the delivery of stimulation to tissue, the only purpose of the stimulation is to provide "the necessary electrical pulses . . . to make the newly formed contractile tissue beat in synchrony with the rest of the heart muscle."[4] Thus, Soykan et al. provides no motivation for improving the characteristics of the interface between tissue and an electrode of an electrical stimulation system via expression of a protein by the tissue that increases the conductivity of the tissue.

Similarly, Heil, Jr. et al. fails to teach or suggest the elution of genetic material to a stimulation site to cause expression of a protein by the tissue at the stimulation site that increases the conductivity of the tissue, as recited by Applicant's amended claim 1. As the Office Action

---

[1] Office Action at page 4, item 10.
[2] Abstract and col. 4, ll. 54-56.
[3] Soykan et al. at col. 5, ll. 47-50.
[4] *Id.* at col. 13, ll. 12-14.

recognized, Heil, Jr. et al. is concerned with the delivery of drugs[5] and does not provide any teaching or suggesting of the delivery of genetic material to a stimulation site, much less a genetic material to cause expression of a protein by the tissue that increases the conductivity of the tissue. Heil, Jr. et al. teaches a system that includes an electrode that elutes steroids or other inflammatory drugs.[6] Heil, Jr. et al. does not even recognize that expression of a transgene may provide advantages over elution of a drug, such as the result in a desired effect that lasts longer and is more localized than that of drug.[7] Accordingly, Heil, Jr. et al. does not cure any deficiencies in Soykan et al, and neither reference teaches or suggests the elements of Applicant's claim 1 as amended.

For similar reasons, Soykan et al., alone or in combination with Heil, Jr., et al. fails to render Applicant's independent claim 21 as amended unpatentable. Amended claim 21 recites a medical lead comprising a lead body, an electrode mounted on a lead body to deliver electrical stimulation to the stimulation site, and a chamber body that defines a chamber, the chamber containing a polymeric matrix that absorbs the genetic material and elutes the genetic material to the tissue at the stimulation site to cause expression of a protein by the tissue at the stimulation site that increases the conductivity of the tissue at the stimulation site.

With the present Amendment, Applicant has amended independent claim 35 to include the limitations of claim 27, and has canceled claim 27. Claim 35 as amended recites a method that comprises placing a polymeric matrix into a chamber formed by a chamber body of a medical lead for elution of genetic material to tissue of a patient at a stimulation site to cause expression of a protein by the tissue at the stimulation site that increases the conductivity of the tissue at the stimulation site. For the reasons discussed above with respect to claim 1, claim 35 is patentable over the applied references.

For at least the foregoing reasons, Soykan et al. does not teach or suggest each and every element of Applicant's independent claims 1, 21 or 35. The other applied reference, Heil, Jr. et al. fails to cure this deficiency in Soykan et al. Accordingly, Applicant's claims 1, 21, and 35 are patentable over Soykan et al. and Heil, Jr. et al. Withdrawal of the rejection of the claims under 35 U.S.C. §§ 102(b) and 103(a) is respectfully requested.

---

[5] Office Action at page 3, item 6; Heil, Jr. et al., Abstract.
[6] Heil Jr. et al. at col. 6, ll. 1-5.
[7] *Id.*

Dependent Claims

In view of the fundamental deficiencies evident in the applied references, it is not necessary to discuss in detail the additional patentable differences presented by the various dependent claims. Applicant addresses some of the dependent claims below for purposes of illustration. In reserving comment to some of the rejections to the dependent claims, however, Applicant neither admits nor acquiesces in the Office Action's interpretation with respect to the teachings in such applied references or with respect to any features set forth in the dependent claims.

With respect to the rejection of dependent claims 14 and 30, the Office Action stated that in Soykan et al., "the genetic material causes expression of an immunosuppressant agent," and referred to column 6, line 1 of Soykan et al.[8] Applicant respectfully disagrees with this analysis of Soykan et al. Soykan et al. teaches at least two different techniques for repopulating damaged myocardium with contractile cells.[9] In a first technique implementing a cellular approach, contractile cells are injected into an infarct zone of a heart.[10] In a second technique implementing a molecular approach, nucleic acid is injected into the infarct zone to convert undifferentiated cells invading the infarct zone into myoblasts.[11] At column 6, line 1, Soykan et al. discusses the first, cellular approach in which contractile cells, rather than genetic material, is injected into an infarct zone of a heart. In particular, at column 6, line 1, Soykan et al. teaches that, "the [undifferentiated contractile cells] are autologous to reduce and/or eliminate the immune response and tissue rejection." This passage in Soykan et al. does not even relate to a technique or system that uses genetic material to repopulate damaged myocardium of a heart, and thus, cannot anticipate Applicant's claims 14 and 30.

Furthermore, Soykan et al. does not teach or suggest a genetic material that causes expression of at least one of a metalloproteinase, an anti-inflammatory agent or an immunosuppressant agent, as required by Applicant's claims 14 and 30. At column 6, line 1, Soykan et al. refers to the type of cells that are used to repopulate damaged myocardium.

---

[8] Office Action at page 4, item 11.
[9] Soykan et al. at col. 5, ll. 54-61.
[10] *Id.* at col. 5, ll. 61-66.
[11] *Id.* at col. 6, ll. 4-10.

"Autologous" cells are cells that are reimplanted in the same individual from which they originate. This is in no way relevant to a genetic material that causes expression of at least one of a metalloproteinase, an anti-inflammatory agent or an immunosuppressant agent.

With respect to the rejection of dependent claims 20 and 34, the Office Action stated that "because the method [of Soykan et al.] is providing contractile tissue between the stimulator and healthy tissue, the method creates a preferential conduction pathway between the stimulation site and intrinsic conduction system."[12] Applicant respectfully disagrees. Soykan et al. does not discuss the creation of a preferential conduction pathway between a stimulation site and intrinsic conduction system of a heart of a patient. As Applicant previously established, nothing in the Soykan et al. even suggests that conductivity of tissue is related to the contractiveness of the tissue. Furthermore, it is unclear why Soykan et al. would even create such a conduction pathway between a stimulation site and intrinsic conduction system. As previously discussed, the stimulation provided by the Soykan et al. system/method is used to provide "the necessary electrical pulses . . . to make the newly formed contractile tissue beat in synchrony with the rest of the heart muscle," and not for the purpose of activating the rest of the heart muscle via the intrinsic conduction system[13]

With respect to the rejection of dependent claims 3, 12, 13, 15, 28, 29, 31, 36, and 38-42, the Office Action acknowledged that neither Soykan et al. nor Heil, Jr. et al. disclose a freeze-dried or frozen matrix, a genetic material causing expression of connexin or IκB, placing the matrix in the lead just before implantation, or soaking the distal end of the lead in the genetic material.[14] In order to cure this deficiency in the applied references, the Office Action concluded that "[i]t is well known in the art to freeze-dry or freeze matrix to increase the shelf-life of the biologically active substance, to provide a genetic material causing expression of connexin or IκB to improve the conductive quality of cardiac tissue, and to soak (or swell) matrix in genetic material before placement into the body . . . to allow autologous biological substances to be implanted." The Office Action did not cite any references that supported the aforementioned assertions of "well known" knowledge in the art.

---

[12] Office Action at page 4, item 15.
[13] *Id.* at col. 13, ll. 12-14.
[14] Office Action at pages 4-5, item 16.

A finding of obviousness must be based upon substantial evidence, and not subjective musings or conjecture by the Office Action.[15] The Office Action cannot rely on unsupported, conclusory statements that elements of Applicant's claims are "well known in the art" to close holes in the evidentiary record.[16] M.P.E.P. § 2144.03 provides guidance as to when it is appropriate to assert that facts are well known. In particular, M.P.E.P. § 2144.03 states that, "[i]t would not be appropriate for the examiner to take official notice of facts without citing a prior art reference where the facts asserted to be well known are not capable of instant and unquestionable demonstration as being well-known." M.P.E.P. § 2144.03 goes on to state that "[i]t is never appropriate to rely solely on 'common knowledge' in the art without evidentiary support in the record, as the principal evidence upon which a rejection was based."

Applicant submits that the assertions of "well known" knowledge in the art presented by the Office Action are not capable of instant and unquestionable demonstration as being well-known. Unless the Office Action can establish an evidentiary record based on concrete prior art references that establish that it would have been obvious to a person with ordinary skill in the art to incorporate the features of Applicant's dependent claims 3, 12, 13, 15, 28, 29, 31, 36, and 38-42, the claims should be allowed.

For at least these reasons, Soykan et al. fails to teach or suggest the elements of Applicant's dependent claims. Heil, Jr. et al. fails to cure the deficiencies in Soykan et al. Accordingly, claims 2-4, 9-20, 22-34, and 36-42 are patentable over the applied references.

[15] *Id.*
[16] *Id.*

CONCLUSION

All claims in this application are in condition for allowance. Applicant respectfully requests reconsideration and prompt allowance of all pending claims. Please charge any additional fees or credit any overpayment to deposit account number 50-1778. The Examiner is invited to telephone the below-signed attorney to discuss this application.

Date: June 28, 2007

By: Jessica H. Kwak

SHUMAKER & SIEFFERT, P.A.
1625 Radio Drive, Suite 300
Woodbury, Minnesota 55125
Telephone: 651.735.1100
Facsimile: 651.735.1102

Name: Jessica H. Kwak
Reg. No.: 58,975